

**WHAT IS CLAIMED IS:**

1. A method for managing information about user equipments (UEs) in a mobile communication system for providing a MBMS (Multimedia Broadcast/Multicast Service) services to the UEs, the mobile communication system including a Node B, a plurality of the UEs capable of communicating with the Node B in a cell occupied by the Node B, and a radio network controller (RNC) for controlling communication of the Node B, a serving GPRS (General Packet Radio Service) support node (SGSN) for managing the RNC, and the UEs to provide a packet switched (PS) service and a circuit switched (CS) service to the UEs, the method comprising the steps of:

transmitting MBMS service-related information of a UE that is in a Packet Mobility Management-Idle (PMM-Idle) mode after joining at least one MBMS service, from the UE to the RNC; and

15 storing the MBMS service-related information in a first service context for the MBMS service held in the RNC, together with managing information about the UE.

2. The method of claim 1, wherein the step of storing the MBMS service-related information comprises the step of adding the information about the UE that transmitted the MBMS service-related information, to the first service context.

3. The method of claim 1, wherein the MBMS service-related information includes at least one service identity (ID) for the at least one MBMS service that the UE has joined.

4. The method of claim 1, wherein the MBMS service-related information includes a service activation indicator for indicating that the UE has joined a certain MBMS service.

5. The method of claim 1, wherein the information about the UE includes at least one of an identity (ID) of the UE and state information of the UE.

5 6. The method of claim 1, further comprising the step of authenticating, by the RNC, the UE, in between the RNC and the SGSN.

7. The method of claim 1, wherein the MBMS service-related information is inserted into one of a connection setup request message and a  
10 connection setup complete message transmitted from the UE to the RNC in an RRC (Radio Resource Control) connection setup procedure between the UE and the RNC.

8. The method of claim 7, wherein the RRC connection setup  
15 procedure is performed for one of the CS service and the PS service of the UE.

9. The method of claim 1, wherein the MBMS service-related information is inserted into an MBMS service request message transmitted from the UE to the RNC after an RRC (Radio Resource Control) connection setup  
20 between the UE and the RNC is completed.

10. The method of claim 1, wherein the step transmitting the MBMS service-related information comprises the step of transmitting an RRC (Radio Resource Control) connection setup message containing a service identity (ID)  
25 for the at least one MBMS service that the UE has joined, from the UE to the RNC, during an RRC connection setup procedure between the UE and the RNC.

11. The method of claim 10, further comprising the steps of:  
transmitting, by the RNC, a validate request message containing an ID of

the UE to a serving node managing the RNC; and

receiving from the serving node a validate response message indicating whether the US has been validated.

5           12.     The method of claim 11, wherein the validate request message further includes at least one of the service ID for the at least one MBMS service .

            13.     The method of claim 12, wherein the serving node determines that validation on the UE is successful, if the ID of the UE is included in a  
10 second service context corresponding to the service ID included in the validate request message.

            14.     The method of claim 13, wherein the serving node adds information about the RNC to the second service context, if the ID of the RNC is  
15 not included in the second service context.

            15.     The method of claim 1, wherein the step of transmitting the MBMS service-related information comprises the step of transmitting a service request message containing a service identity (ID) for the at least one MBMS  
20 service that the UE has joined, from the UE to the RNC, after the UE sets up an RRC connection for one of the CS service and the PS service with the RNC.

            16.     The method of claim 15, further comprising the steps of:  
transmitting, by the RNC, a validate request message containing an ID of  
25 the UE to a serving node managing the RNC; and  
receiving from the serving node a validate response message indicating whether the UE has been validated.

            17.     The method of claim 16, wherein the validate request message  
30 further includes at least one of the service ID of the MBMS service.

18. The method of claim 17, wherein the serving node determines that validation on the UE is successful, if the ID of the UE is included in a second service context corresponding to the service ID included in the validate  
5 request message.

19. The method of claim 18, wherein the serving node adds information about the RNC to the second service context, if the ID of the RNC is not included in the second service context.

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20. The method of claim 1, wherein the step of transmitting the MBMS service-related information comprises the steps of:

transmitting an RRC connection setup message containing an MBMS service activation indicator indicating existence of a particular MBMS service  
15 that the UE has joined, from the UE to the RNC, during an RRC connection setup procedure between the UE and the RNC;

transmitting, by the RNC, a service list request message containing an identity (ID) of the UE to a serving node managing the RNC; and

receiving, by the RNC, a service list response message containing at least  
20 one service ID indicating at least one MBMS service that the UE has joined, from the serving node.

21. The method of claim 20, wherein the service list request message further includes an ID of the RNC.

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22. The method of claim 20, further comprising the step of searching, by the serving node, for the at least one service ID for the at least one MBMS service that the UE has joined, using the ID of the UE.

30 23. The method of claim 22, wherein the serving node adds an ID of

the RNC to a second service context, if the ID of the RNC is not included in the second service context corresponding to the service ID for the at least one MBMS service that the UE has joined.

5           24.     The method of claim 1, wherein the step of transmitting the MBMS service-related information comprises the steps of:

              transmitting a service request message containing an MBMS service activation indicator indicating existence of a particular MBMS service that the UE has joined, from the UE to the RNC, after an RRC (Radio Resource Control)

10 connection setup between the UE and the RNC is completed;

              transmitting, by the RNC, a service list request message containing an ID of the UE to a serving node managing the RNC; and

              receiving, by the RNC, a service list response message containing at least one service ID indicating the at least one MBMS service that the UE has joined,  
15 from the serving node;

              25.     The method of claim 24, wherein the service list request message further includes an ID of the RNC.

20           26.     The method of claim 24, further comprising the step of searching, by the serving node, for the at least one service ID for the at least one MBMS service that the UE has joined, using the ID of the UE.

              27.     The method of claim 26, wherein the serving node adds the ID of  
25 the RNC to a second service context, if the ID of the RNC is not included in the second service context corresponding to the at least one service ID for the at least one MBMS service that the UE has joined.

              28.     The method of claim 1, wherein the step of storing the MBMS  
30 service-related information comprises the steps of:

searching for the first service context for the at least one MBMS service that the UE has joined, and generating the first service context, if the first service context does not exist; and

adding the information about the UE to the first service context, if an  
5 identity (ID) of the UE is not included in the first service context.

29. The method of claim 28, wherein the information about the UE indicates that the UE has an RRC (Radio Resource Control) connection after joining the at least one MBMS service and does not have PS signaling.

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30. A method for managing information about user equipments (UEs) in a mobile communication system for providing an MBMS (Multimedia Broadcast/Multicast Service) service to the UEs, the system including a Node B, a plurality of the UEs capable of communicating with the Node B in a cell  
15 occupied by the Node B, a radio network controller (RNC) for controlling communication of the Node B and the UEs to provide one of a packet switched (PS) service and a circuit switched (CS) service to the UEs, and a serving node for managing the RNC, the method comprising the steps of:

transmitting MBMS service-related information of a UE that is in a  
20 Packet Mobility Management-Idle (PMM-Idle) mode after joining at least one MBMS service, from the UE to the serving node;

linking the MBMS service-related information with information about the UE; and

storing the MBMS service-related information linked to the information  
25 about the UE in a first service context for the at least one MBMS service in the serving node.

31. The method of claim 30, wherein the step of storing the MBMS service-related information comprises the step of adding information about the  
30 UE that transmitted the MBMS service-related information, to the first service

context.

32. The method of claim 30, wherein the MBMS service-related information includes at least one service identity (ID) for the at least one MBMS  
5 service that the UE has joined.

33. The method of claim 30, wherein the MBMS service-related information includes a service activation indicator for indicating that the UE has joined a certain MBMS service.

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34. The method of claim 30, wherein the MBMS service-related information is inserted into one of a connection setup request message and a connection setup complete message transmitted from the UE to the RNC during an RRC (Radio Resource Control) connection setup procedure between the UE  
15 and the RNC.

35. The method of claim 30, wherein the information about the UE includes at least one of an ID of the UE and state information of the UE.

20 36. The method of claim 34, wherein the RRC connection setup procedure is performed for the CS service of the UE.<sup>6</sup>

37. The method of claim 30, wherein the MBMS service-related information is inserted into an MBMS service request message transmitted from  
25 the UE to the RNC after an RRC (Radio Resource Control) connection setup between the UE and the RNC is completed.

38. The method of claim 30, wherein the step of transmitting the MBMS service-related information comprises the steps of:  
30 transmitting an RRC (Radio Resource Control) connection setup

message containing a service ID for the at least one MBMS service that the UE has joined, from the UE to the RNC, during an RRC connection setup procedure between the UE and the RNC;

transmitting, by the RNC, a validate request message containing an ID of  
5 the UE to the serving node; and

receiving from the serving node a validate response message indicating whether the UE has been validated.

39. The method of claim 38, wherein the validate request message  
10 further includes the service ID of the MBMS.

40. The method of claim 39, wherein the serving node determines that validation on the UE is successful, if the ID of the UE is included in the first service context corresponding to the service ID included in the validate request  
15 message.

41. The method of claim 39, wherein the serving node adds information about the RNC to the first service context, if the ID of the RNC is not included in the first service context.

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42. The method of claim 30, wherein the step of transmitting the MBMS service-related information comprises the step of transmitting a service request message containing a service identity (ID) for the at least one MBMS service that the UE has joined, from the UE to the serving node, after the UE sets  
25 up an RRC (Radio Resource Control) connection for on of the CS service and the PS service with the RNC.

43. The method of claim 42, further comprising the steps of:  
transmitting, by the serving node, a linking request message containing  
30 the service ID to the RNC;



adding, by the RNC, the information about the UE to a second service context for the service ID in response to the linking request message; and

transmitting, by the RNC, a linking response message corresponding to the linking request message to the serving node.

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44. The method of claim 42, wherein the serving node adds information about the RNC to the first service context, if the ID of the RNC is not included in the first service context.

10 45. The method of claim 30, wherein the step of transmitting the MBMS service-related information comprises the steps of:

transmitting an RRC (Radio Resource Control) connection setup message containing an MBMS service activation indicator indicating existence of a particular MBMS service that the UE has joined, from the UE to the RNC, 15 during an RRC connection setup procedure between the UE and the RNC;

transmitting, by the RNC, a service list request message containing an identity (ID) of the UE to the serving node; and

receiving, by the RNC, a service list response message containing at least one service ID indicating the at least one MBMS service that the UE has joined, 20 from the serving node.

46. The method of claim 45, wherein the service list request message further includes an ID of the RNC.

25 47. The method of claim 45, further comprising the step of searching, by the serving node, for the service ID for the at least one MBMS service that the UE has joined, using the ID of the UE.

48. The method of claim 47, wherein the serving node adds an ID of 30 the RNC to the first service context, if the ID of the RNC is not included in the

first service context corresponding to the service ID for the at least one MBMS service that the UE has joined.

49. The method of claim 30, wherein the step of transmitting the  
5 MBMS service-related information comprises the steps of:

transmitting a service request message containing an MBMS service activation indicator indicating existence of a particular MBMS service that the UE has joined, from the UE to the serving node, after an RRC (Radio Resource Control) connection setup between the UE and the RNC is completed; and

10 searching, by the serving node, for a service identity (ID) for the at least one MBMS service that the UE has joined, using an ID of the UE.

50. The method of claim 30, wherein the step of transmitting the MBMS service-related information comprises the steps of:

15 searching for the first service context for the at least one MBMS service that the UE has joined, and generating the first service context, if the first service context does not exist; and

adding the information about the UE to the first service context, if the ID of the UE is not included in the first service context.

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51. The method of claim 50, wherein the information about the UE indicates that the UE has an RRC (Radio Resource Control) connection after joining the at least one MBMS service, and does not have PS signaling.